

What is claimed is:

- 5 1. A system for treatment of exhaust emissions from a compression-ignited internal combustion engine, comprising:
- (A) a superatmospheric-pressurized source of gaseous oxygen;
- (B) an inlet for the gaseous oxygen from the superatmospheric-pressurized source wherein the exhaust emissions from the engine flow past the inlet and form a mixture
10 with the gaseous oxygen from the inlet; and
- (C) a diesel particulate filter or catalyzed diesel particulate filter through which the mixture of exhaust emissions from the engine and gaseous oxygen from the inlet flows, wherein the oxygen content of the mixture is greater than the oxygen content of the exhaust emissions from the engine.
- 15 2. The system of claim 1 wherein the gaseous oxygen is continuously introduced into the inlet for mixing with the engine exhaust emissions during the operation of the engine.
3. The system of claim 1 wherein the gaseous oxygen is intermittently introduced into
20 the inlet for mixing with the engine exhaust emissions during the operation of the engine.
4. The system of claim 1 wherein the oxygen content of the mixture is greater than the oxygen content of the exhaust emissions from the engine by at least 0.1% by volume.
- 25 5. The system of claim 1 wherein the source of gaseous oxygen is air, oxygen, an oxygen containing gas, or a mixture thereof wherein the oxygen containing gas has an oxygen content of 1 to 99% by volume.
- 30 6. The system of claim 1 wherein the superatmospheric-pressurized source of gaseous oxygen comprises a compressor, a blower, a compressed gas storage container, or a mixture thereof.

7. The system of claim 6 wherein the gas in the compressed gas storage container is air, oxygen, or an oxygen containing gas having an oxygen content greater than 21% by volume to 99% by volume.
- 5 8. The system of claim 6 wherein the superatmospheric-pressurized source of gaseous oxygen further comprises a permeable membrane wherein the membrane provides oxygen or a gas having an increased oxygen content from a mixture of gases that includes oxygen.
- 10 9. The system of claim 1 wherein the diesel particulate filter or catalyzed diesel particulate filter comprises 2 or more sections wherein each section is capable of being separately regenerated.
10. The system of claim 1 wherein the catalyzed diesel particulate filter is a coated
15 wall-flow ceramic monolith wherein the coating comprises 5 to 150 g/ft³ of a catalyst metal.
11. The system of claim 10 wherein the catalyst metal is platinum, palladium, rhodium, ruthenium, vanadium, magnesium, calcium, strontium, barium, copper, silver,
20 or a mixture thereof.
12. A system for treatment of exhaust emissions from a compression-ignited internal combustion engine, comprising:
- 25 atmospheric air as a source of gaseous oxygen;
- an inlet for the atmospheric air wherein exhaust emissions from the engine flow through a venturi which draws in the atmospheric air through the inlet forming a mixture of exhaust emissions and atmospheric air; and
- the diesel particulate filter or catalyzed diesel particulate filter of claim 1 through which the mixture of exhaust emissions and atmospheric air flows wherein the
30 oxygen content of the mixture is greater than the oxygen content of the exhaust emissions from the engine.

13. The system of claim 1, further comprising:
(D) at least one heat source.
14. The system of claim 13 wherein the heat source is a heater or a heat exchanger.
- 5 15. The system of claim 1, further comprising:
(E) a control unit.
16. The system of claim 1, further comprising:
10 (F) at least one component selected from the group consisting of a diesel oxidation catalyst, a selective catalytic reduction catalyst and a lean NO_x catalyst.
17. The system of claim 1, further comprising:
(G) an outlet for recirculating a portion of the exhaust emissions from the engine
15 to an air intake of a combustion system of the engine.
18. A method for improving the performance of a diesel particulate filter or catalyzed diesel particulate filter in a compression-ignited internal combustion engine, comprising:
operating the engine; and
20 treating the exhaust emissions from the engine with the system of claim 1.
19. The method of claim 18 wherein the temperature for regeneration of the diesel particulate filter or catalyzed diesel particulate filter is decreased by 1 to 200°C.
- 25 20. The method of claim 18 wherein the rate for regeneration of the diesel particulate filter or catalyzed diesel particulate filter is increased.